

What is claimed is:

[Claim 1] 1. An active matrix organic electro-luminescent display panel, comprising:

a pixel structure layer, disposed on a substrate, wherein the pixel structure layer comprises an active device matrix and an anode pattern layer;
an organic light-emitting layer, disposed at least over the anode pattern layer, wherein the organic light-emitting layer comprises at least a first organic light-emitting pattern, at least a second organic light-emitting pattern and at least a third organic light-emitting pattern; and
a cathode layer, disposed on the organic light-emitting layer, wherein the cathode layer comprises a first cathode pattern disposed on the first organic light-emitting pattern, a second cathode pattern disposed on the second organic light-emitting pattern and a third cathode pattern disposed on the third organic light-emitting pattern, and the first, the second and the third cathode patterns are not connected to each other.

[Claim 2] 2. The display panel of claim 1, wherein the first, the second and the third cathode pattern are each electrically connected to a corresponding voltage source.

[Claim 3] 3. The display panel of claim 1, further comprising a plurality of cathode lines electrically connected to the first, the second and the third cathode pattern respectively.

[Claim 4] 4. The display panel of claim 1, further comprising a partition rib structure disposed over the active device matrix and the anode pattern layer so that the first, the second and the third organic light-emitting pattern are isolated from each other.

[Claim 5] 5. The display panel of claim 4, wherein the partition rib structure further isolates the first, the second and the third cathode pattern from each other.

[Claim 6] 6. The display panel of claim 4, wherein the top surface of the partition rib structure has a width greater than of the bottom surface of the partition rib structure.

[Claim 7] 7. The display panel of claim 1, wherein the first, the second and the third organic light-emitting pattern are fabricated using red light-emitting material, green light-emitting material and blue light-emitting material respectively.

[Claim 8] 8. The display panel of claim 1, wherein the active device matrix comprises a thin film transistor array.

[Claim 9] 9. A method of fabricating an active matrix organic electro-luminescent display panel, comprising:

forming a pixel structure layer over a substrate, wherein the process of forming the pixel structure layer comprises forming an active device matrix and an anode pattern layer sequentially over the substrate;

forming an organic light-emitting layer over the substrate to cover at least the anode pattern layer, wherein the organic light-emitting layer comprises at least a first organic light-emitting pattern, at least a second organic light-emitting pattern and at least a third organic light-emitting pattern; and forming a cathode pattern layer over the organic light-emitting layer, wherein the cathode pattern layer comprises a first cathode pattern formed on the first organic light-emitting pattern, a second cathode pattern formed on the second organic light-emitting pattern and a third cathode pattern formed on the third organic light-emitting pattern, and the first, the second and the third cathode pattern are not connected to each other.

[Claim 10] 10. The method of claim 9, wherein after the step for forming the active device matrix and the anode pattern layer, further comprises forming a plurality of cathode lines and after the step of forming the first, the second and the third cathode pattern, the cathode lines are electrically connected to the first, the second and the third cathode pattern respectively.

[Claim 11] 11. The method of claim 10, wherein the first, the second and the third cathode pattern are each electrically connected to a corresponding operating voltage.

[Claim 12] 12. The method of claim 10, wherein after forming the cathode lines, further comprises:

forming a partition rib structure over the substrate, wherein the partition rib structure is disposed over the cathode lines;

forming a first, a second and a third contact opening in the partition rib structure at the junction between the cathode pattern layer and the partition rib structure;

forming the organic light-emitting layer; and

forming the cathode pattern layer over the organic light-emitting layer, wherein the first, the second and the third cathode pattern are electrically connected to a corresponding cathode line through the first, the second and the third contact opening.

[Claim 13] 13. The method of claim 12, wherein the step of forming the cathode pattern layer comprises performing a cathode deposition process such that the first, the second and the third cathode pattern are separated from each other by the partition rib structure.

[Claim 14] 14. The method of claim 9, wherein before the step of forming the organic light-emitting layer, further comprises forming a partition rib structure over the active device matrix and the anode pattern layer.

[Claim 15] 15. The method of claim 14, wherein the step of forming the organic light-emitting layer comprises performing an ink-jet process.

[Claim 16] 16. The method of claim 14, wherein the step of forming the cathode pattern layer comprises performing a cathode deposition process such that the first, the second and the third cathode pattern are separated from each other by the partition rib structure.

[Claim 17] 17. The method of claim 9, wherein before forming the organic light-emitting layer, further comprises forming a plurality of

cathode lines over the substrate, and after forming the organic light-emitting layer, further comprises:

patterning the organic light-emitting layer to form a first, a second and a third contact opening in the first, the second and the third organic light-emitting pattern respectively; and

forming the cathode pattern layer over the organic light-emitting layer such that the first, the second and the third cathode pattern are electrically connected to a corresponding cathode line through the first, the second and the third contact opening.

[Claim 18] 18. The method of claim 17, wherein after forming the cathode lines, further comprises forming a partition rib structure over the active device matrix and the anode pattern layer.

[Claim 19] 19. The method of claim 17, wherein the step of forming the organic light-emitting layer comprises performing an ink-jet process.

[Claim 20] 20. The method of claim 17, wherein the step of forming the cathode pattern layer comprises performing a cathode deposition process such that the first, the second and the third cathode pattern are separated from each other by the partition rib structure.